*AP Biology*

**Modeling Diffusion and Osmosis**

**Determining molarity of rainbow solutions**

The interactions between selectively permeable membranes, water, and solutes are important in cellular and organismal functions. For example, water and nutrients move from plant roots to the leaves and shoots because of differences in water potentials. Based upon what you know and what you have learned about osmosis, diffusion, and water potential in the course of your investigations, think about these questions. You will make model cells of a solution and determine its molarity.

* *What would happen if you applied saltwater to the roots of a plant? Why?*
* *How does a plant control turgor pressure?*
* *Will water move into or out of a plant cell if the cell has a higher water potential than*

*its surrounding environment?*

* *Can you predict the direction of osmosis in living cells when cells are placed in various solutions?*
* *When will the net osmosis rate equal zero in your model cells? Will it ever be truly zero?*

**Procedure**:

1. Obtain two dialysis tubes, and open them up. Tie off one end for each.
2. Put 10 ml of the unknown colored solution designated by the instructor. Press additional air out of bag and then tie off other end. Leave room for expansion.
3. Weigh dialysis tube.
4. Place tube in cup of distilled water. Leave overnight.
5. Weigh dialysis tube next day.
6. Compare results and determine what the molarities of the unknown solutions are.

For your inquiry lab experiment, you will design an experiment to identify the water potential of a plant cell by using known sucrose solution concentrations tested previously. **\*\*\*BRING YOUR VEGETABLE FOR TESTING TOMORROW!!**

Questions to consider for your investigation:

* *What plant cells will you use? (Choose a vegetable you can cut up into small pieces)*
* *What cell transport process(es) may be happening?*
* *What would be the independent and dependent variable?*
* *What would be the controlled variables?*
* *What data would you collect?*
* *How would you conduct your experiment?*
* *How could you graph the results?*
* *How would you calculate the water potential in your vegetable cells?*

*• What sucrose solution had a molarity equal to that of your vegetable cells? How would you know?*

*• Would the water potential in different vegetables be the same?*